

Heavy and almost continuous rains fell over north-eastern Arizona from September 16 to 18, inclusive, and for several days that portion of the State east of Flagstaff was cut off from the remainder of the State. The main line of the Atchison, Topeka & Santa Fe Railroad was put out of commission by washouts, State highways were rendered impassable, and telegraph and telephone communication suspended. The principal damage occurred at and in the vicinity of the town of Holbrook at the junction of the Rio Puerco and Little Colorado Rivers, where many buildings, including residences, were washed away and one life was lost. Streets were inundated and much property along the river banks carried away by erosion. Trains were rerouted through western New Mexico and southern Arizona, and one such train en route from Phoenix, Ariz., northward, was wrecked near Wickenburg, Ariz., resulting in the death of four persons. The rainfall at Wickenburg during September 17 and 18 amounted to 4.50 inches.

*Flood stages during September.*

River and station.	Flood stage.	Above flood stages—dates.		Crest.	
		From—	To—	Stage.	Date.
ATLANTIC DRAINAGE.					
Roanoke: Weldon, N. C.....	<i>Feet.</i> 30	25	25	30.0	25
Saluda: Chappels, S. C.....	14	1	1	14.4	1
Santee:					
Rimini, S. C.....	12	(1)	4	13.2	2
Ferguson, S. C.....	12	2	7	12.5	5
MISSISSIPPI DRAINAGE.					
Arkansas: Wichita, Kans.....	9	28	29	10.5	29
Purgatoire: Higbee, Colo.....	4	18	18	5.0	18
Little Arkansas:					
Sedgwick, Kans.....	18	27	28	24.8	27
Hellers Grove, Kans.....	12	14	15	15.4	14-15
Midian Shrine, Kans. (Wichita, Kans.)	12	28	28	13.5	28
Canadian, North Fork:					
Woodward, Okla.....	3	18	21	5.3	19
Canton, Okla.....	4	20	20	4.2	20
Oklahoma City, Okla.....	12	20	20	12.2	20
Do.....	12	23	25	13.3	24
WEST GULF DRAINAGE.					
Nueces: Cotulla, Tex.....	15	7	10	16.0	7
RIO GRANDE DRAINAGE.					
Rio Grande:					
Mission, Tex.....	24	12	13	24.5	13
Do.....	24	23	25	25.4	24
Rio Grande City, Tex.....	15	9	13	23.3	11
Do.....	15	21	24	21.5	22
San Benito, Tex.....	21	10	(*)	23.3	22-24
COLORADO DRAINAGE.					
Colorado: Lees Ferry, Ariz.....	12	20	20	13.5	20

<sup>1</sup> Continued from August.  
<sup>2</sup> Continued into October.

**MEAN LAKE LEVELS DURING SEPTEMBER, 1923.**

By UNITED STATES LAKE SURVEY.

[Detroit, Mich., October 3, 1923.]

The following data are reported in the "Notice to Mariners" of the above date:

Data	Lakes. <sup>1</sup>			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Mean level during September, 1923:				
Above mean sea level at New York.....	Feet. 602.10	Feet. 579.64	Feet. 571.55	Feet. 245.03
Above or below—				
Mean stage of August, 1923.....	+0.04	-0.12	-0.15	-0.38
Mean stage of September, 1922.....	-0.56	-0.73	-0.77	-1.00
Average stage for September last 10 years.....	-0.66	-1.09	-0.94	-1.16
Highest recorded September stage.....	-1.98	-3.79	-2.39	-2.58
Lowest recorded September stage.....	+0.61	-0.02	+0.27	+1.03
Average relation of the September level to:				
August level.....		-0.2	-0.3	-0.4
October level.....		+0.2	+0.3	+0.4

<sup>1</sup> Lake St. Clair's level: In September 574.49 feet.

**EFFECT OF THE WEATHER ON CROPS AND FARMING OPERATIONS, SEPTEMBER, 1923.**

By J. B. KINCEP, Meteorologist.

The weather during September was favorable, in the main, for field work and farming operations made satisfactory advance in most sections of the country. The soil condition was especially favorable for the preparation for wheat seeding in the central valleys and Great Plains States, and there was sufficient rain for improvement in the far Northwest.

Threshing small grains made rapid progress in the more northwestern districts, but in some parts of the upper Mississippi Valley, especially in Iowa, frequent rains were rather unfavorable for threshing oats, though conditions improved after the first few days of the month. Rainfall in the lower Great Plains was particularly timely for the preparation of wheat land in some sections where it had been too dry. At the close of the month the soil had again become too dry in the more northwestern States.

Unseasonably cool weather prevailed in north-central districts about the middle of the month, when freezing temperatures occurred in numerous localities in the northern border States from North Dakota eastward. Heavy to killing frosts occurred in most sections of Minnesota and Wisconsin, with severe damage to some crops, particularly to late truck and gardens. There was also a varying amount of frost damage in Iowa, northern Illinois, central and northern Indiana, Ohio, New York,

and New England. Much late corn was caught in Minnesota and Wisconsin, but in Iowa damage was largely confined to the north-central and northeastern portions, where it was rather heavy in some sections. Potatoes were heavily damaged in some Central-Northern States, while tobacco suffered severely in Wisconsin. Little or no frost injury occurred during the latter part of the month. During this period corn ripened rapidly in the Great Plains States, but maturity was slow in the Ohio and upper Mississippi Valleys, because of persistently damp, cloudy weather.

The drought that had prevailed during August in the western portion of the Cotton Belt was effectively broken, but there was no material improvement in the general condition of cotton in that area, while frequent rains interrupted picking and ginning, particularly in the northwestern portion of the belt. There was little change, likewise, in the condition of cotton in the eastern

portion, though seasonable temperatures and generally light rainfall throughout the month were favorable for picking and ginning, which made rapid progress. At the close of the month picking was nearly completed in the southern portions of Mississippi and Alabama, well advanced in Georgia, and about finished in the southern counties of South Carolina.

Pasture lands continued in unusually good condition for the season in nearly all sections east of the Rocky Mountains, except in portions of the east Gulf States, and, during much of the month, in parts of the middle Atlantic coast area where moisture was deficient. Widespread rains in nearly all section of the country from the Great Plains eastward during the week ending September 25 were very beneficial to pastures, especially in New York, New Jersey, and Pennsylvania, while, at the same time, the range in much of the far Southwest was improved by generous showers.

CLIMATOLOGICAL TABLES.<sup>1</sup>

## CONDENSED CLIMATOLOGICAL SUMMARY.

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

*Condensed climatological summary of temperature and precipitation by sections, September, 1923.*

Section.	Temperature.								Precipitation.							
	Section average.	Departure from the normal.	Monthly extremes.						Section average.	Departure from the normal.	Greatest monthly.		Least monthly.			
			Station.	Highest.	Date.	Station.	Lowest.	Date.			Station.	Amount.	Station.	Amount.		
	* F.	* F.		* F.			* F.		In.	In.		In.		In.		
Alabama.....	76.2	+1.1	2 stations.....	96	* 13	Valley Head.....	46	25	1.23	-2.17	Eufaula.....	4.55	2 stations.....	0.00		
Alaska.....																
Arizona.....	69.9	-2.8	2 stations.....	113	* 5	Spring Valley R. S. ....	14	27	1.72	+0.39	Mormon Lake.....	9.44	Florence.....	0.00		
Arkansas.....	73.0	-0.9	Booneville.....	98	11	Dutton.....	45	* 23	5.56	+2.23	Mena.....	13.91	Warren.....	1.39		
California.....	69.1	+2.0	Greenland Ranch.....	120	9	Tamarack.....	20	26	1.23	+0.68	Helm Creek.....	6.02	2 stations.....	0.00		
Colorado.....	55.0	-2.1	Lamar.....	97	9	Silverton.....	10	28	1.66	+0.27	Palisade Lake.....	5.38	Grover.....	T		
Florida.....	79.7	+0.4	3 stations.....	98	* 4	Quincy.....	57	29	4.75	-1.89	St. Cloud.....	9.83	Bluff Springs.....	1.02		
Georgia.....	76.5	+1.5	Alapaha.....	100	7	Clayton.....	41	21	1.97	-1.70	Millen.....	6.05	Newnan.....	0.10		
Hawaii.....	75.5	+0.8	2 stations.....	93	* 29	2 stations.....	52	* 3	6.40	-0.13	Pahuaumimi.....	39.60	2 stations.....	0.00		
Idaho.....	59.9	+2.6	Glenns Ferry.....	104	2	Stanley.....	12	6	0.68	-0.33	Lifton.....	2.28	Spencer.....	T		
Illinois.....	66.6	-0.4	Carbondale.....	95	28	Mount Carroll.....	28	14	3.98	+0.47	Hillsboro.....	7.32	Mascoutah.....	1.24		
Indiana.....	67.0	+0.3	Crawfordsville.....	95	4	Connersville.....	28	14	3.40	+0.40	South Bend.....	7.83	Williams.....	0.93		
Iowa.....	64.2	+0.8	6 stations.....	92	* 3	2 stations.....	28	14	5.79	+2.43	Washington.....	12.14	Centerville.....	1.83		
Kansas.....	69.6	+0.1	2 stations.....	101	10	St. Francis.....	31	29	4.21	+1.40	Medicine Lodge.....	13.36	Bird City.....	0.48		
Kentucky.....	69.8	-0.2	3 stations.....	94	* 27	Farmers.....	30	16	2.87	+0.11	Paducah.....	5.34	Scott.....	0.60		
Louisiana.....	77.8	+0.1	Dodson.....	97	27	2 stations.....	50	* 24	5.24	+1.24	Grand Chenier.....	9.90	New Orleans No. 2.....	1.38		
Maryland—Delaware.....	68.3	+1.2	Western Port, Md.....	92	2	Grantsville, Md.....	28	16	3.51	+0.31	Cecilton, Md.....	7.27	Costen, Md.....	1.22		
Michigan.....	59.9	+0.2	Webber Dam.....	92	5	Houghton Lake.....	24	15	3.23	+0.23	Bloomington.....	7.42	St. James.....	0.86		
Minnesota.....	60.8	+2.4	Beardsley.....	98	4	Angus.....	19	13	2.31	-0.49	Grand Meadow.....	8.28	Little Falls.....	0.50		
Mississippi.....	76.6	+0.4	5 stations.....	97	* 2	Port Gibson.....	51	24	2.15	-1.19	Cleveland.....	5.17	Lake.....	0.30		
Missouri.....	68.7	-0.3	Caruthersville (2).....	98	* 3	Unionville.....	33	14	4.59	+0.85	Downing.....	11.83	Patton.....	1.23		
Montana.....	57.3	+2.1	Roy.....	102	5	Outlook.....	18	11	1.37	+0.02	Red Lodge.....	9.32	Harlowton.....	0.00		
Nebraska.....	64.3	+0.4	4 stations.....	97	* 3	Nenah.....	29	13	3.70	+1.56	Utica.....	11.06	Kimball.....	0.55		
Nevada.....	63.0	+0.6	Beatty.....	112	8	Rye Patch.....	20	17	0.96	+0.48	Schurz.....	3.57	Mina.....	0.08		
New England.....	61.2	+1.8	Lowell, Mass.....	90	* 1	3 stations.....	26	* 18	2.40	-1.16	Pittsburg, N. H.....	5.87	Boston, Mass.....	0.38		
New Jersey.....	67.0	+1.3	3 stations.....	90	* 1	Charlottesville.....	23	18	3.78	+0.18	Cape May City.....	6.26	Little Falls.....	2.24		
New Mexico.....	62.5	-1.8	Orogrande.....	100	3	2 stations.....	22	* 28	1.91	+0.29	Diner.....	6.74	Fort Sumner.....	0.08		
New York.....	61.8	+0.9	4 stations.....	91	* 1	2 stations.....	24	17	3.54	+0.20	Walden.....	5.75	Ogdensburg.....	1.24		
North Carolina.....	71.5	+1.7	Greenville.....	98	* 4	Wenona.....	36	18	3.96	+0.16	Neuse.....	7.82	Cullowhee.....	0.65		
North Dakota.....	60.1	+3.7	Donnybrook.....	99	3	Hansboro.....	15	13	2.39	+0.75	New England.....	5.80	Powers Lake.....	0.23		
Ohio.....	65.7	+0.3	Middleport.....	96	26	Canfield.....	24	15	3.12	+0.62	Pataskala.....	6.26	Green.....	0.75		
Oklahoma.....	73.9	+0.2	Oakwood.....	103	12	Kenton.....	38	29	7.07	+4.21	Tuskahoma.....	14.43	Ardmore.....	2.23		
Oregon.....	61.4	+2.7	2 stations.....	104	* 6	Lapine.....	12	19	0.91	-0.54	Siskiyou.....	3.53	Bend.....	0.05		
Pennsylvania.....	64.8	+1.2	Lancaster.....	92	4	West Bingham.....	22	17	3.55	+0.32	Biglerville.....	8.68	Parkers Landing.....	1.54		
Porto Rico.....	79.2	+0.3	3 stations.....	97	* 5	Albionito.....	56	20	5.54	-2.62	Lares.....	10.51	Santa Isabel.....	1.26		
South Carolina.....	75.5	+1.2	Garnett.....	99	7	2 stations.....	50	* 14	2.67	-1.15	Wedgfield.....	9.62	Greenwood.....	0.44		
South Dakota.....	62.4	+1.8	2 stations.....	100	4	Elk Mountain.....	22	17	3.24	+1.37	Vale.....	7.34	Britton.....	0.97		
Tennessee.....	71.5	+0.4	Perryville.....	95	* 27	Rugby.....	38	* 15	2.57	-0.36	Covington.....	6.39	Copperhill.....	0.41		
Texas.....	77.9	+0.8	Enclinal.....	107	1	Clint.....	40	20	4.61	+1.79	Fort McIntosh.....	12.94	O 2 Ranch.....	0.30		
Utah.....	59.0	-0.9	St. George.....	104	6	Loa.....	19	27	1.07	-0.08	Lower Mill Creek.....	3.27	Midlake.....	0.00		
Virginia.....	68.7	+0.8	Danville.....	93	* 3	Burkes Garden.....	35	15	3.98	+0.80	Diamond Springs.....	7.30	Speers Ferry.....	1.55		
Washington.....	60.6	+2.6	Trinidad.....	100	8	Wilbur.....	20	23	0.98	-0.69	Silverton.....	3.48	Rimrock.....	0.03		
West Virginia.....	66.5	+0.8	Robertsburg.....	96	25	Terra Alta.....	29	10	3.31	+0.40	Organ Cave.....	5.36	Beckley.....	1.00		
Wisconsin.....	59.8	+0.2	2 stations.....	90	5	7 stations.....	21	* 13	3.28	-0.28	Meadow Valley.....	7.22	Hayward.....	0.75		
Wyoming.....	54.8	+0.1	2 stations.....	98	* 3	Riverside.....	11	* 18	3.43	+2.17	Verona.....	8.61	Gallatin.....	0.89		

<sup>1</sup> For description of tables and charts, see REVIEW, July, 1922, pp. 334-355

<sup>2</sup> Other dates also.